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# *Indian Standard*

## METHODS FOR SAMPLING OF ABRASIVE EMERY GRAIN

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**INDIAN STANDARDS INSTITUTION**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# Indian Standard

## METHODS FOR SAMPLING OF ABRASIVE EMERY GRAIN

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# *Indian Standard*

## METHODS FOR SAMPLING OF ABRASIVE EMERY GRAIN

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 11 July 1969, after the draft finalized by the Abrasives Sectional Committee had been approved by the Mechanical Engineering Division Council.

**0.2** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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### **1. SCOPE**

**1.1** This standard prescribes methods for sampling of abrasive emery grain and the criteria for judging its conformity to the requirements specified in IS : 3178-1965† for acceptance purposes.

### **2. TERMINOLOGY**

**2.0** For the purpose of this standard, the following definitions shall apply.

**2.1 Batch** — A definite quantity of abrasive material manufactured or produced under uniform conditions in continuation.

**2.2 Consignment** — The quantity of emery grain delivered at one time.

**2.3 Lot** — In any consignment, all the packages containing the same quantity of the particular abrasive material of definite grit and drawn from the same batch of manufacture shall constitute a lot.

**2.4 Mean  $\bar{X}$**  — The sum of observations divided by the number of observations.

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\*Rules for rounding off numerical values (revised).

†Specification for abrasive emery grain.

**2.5 Range R** — The difference between the largest and the smallest observations in a sample.

**2.6 Sample** — Collection of packages selected from a lot.

**2.7 Test Sample** — The sample as used in the laboratory.

### 3. GENERAL PRECAUTIONS

**3.1** The following precautions shall be taken in drawing and handling of test samples.

**3.1.1** Sample shall be taken at a protected place.

**3.1.2** The sampling instrument shall be clean and dry.

**3.1.3** Precautions shall be taken to protect the test samples, the material being sampled, the sampling instrument and the containers for test samples from moisture and other extraneous materials.

**3.1.4** The test samples shall be placed in a clean, dry and air-tight glass or other suitable containers on which the material has no action.

**3.1.5** Each container, after filling, shall be sealed air-tight with a stopper and marked with full details of the material and the date of sampling.

### 4. SCALE OF SAMPLING

**4.1** For ascertaining the conformity of the material in the lot to the requirements of the specification, tests shall be carried out for each lot separately. The sample size,  $n$ , that is the number of packages to be selected for this purpose, shall depend on the weight of the lot and shall be in accordance with Table 1.

TABLE 1 SCALE OF SAMPLING

WEIGHT OF THE LOT IN TONNES	SAMPLE SIZE $n$
(1)	(2)
Below 1	3
1 and up to 5	4
5 and up to 10	5
10 and up to 25	7
25 and up to 50	9
50 and above	10

**4.2** After ascertaining the number of packages,  $N$ , in the lot, the sample packages shall be chosen at random from the lot and in order to ensure the randomness of selection, a random number table shall be used (*see* IS: 4905-1968\*). In case such a table is not available, the following procedure is recommended for use:

Starting from any package in the lot, count them as 1, 2, 3, ..., etc, up to  $r$  and so on, where  $r$  is equal to the integral part of  $N/n$ . Every  $r$ th package thus counted shall be withdrawn from the lot to give a sample for test.

## 5. TEST SAMPLES AND REFEREE SAMPLE

### 5.1 Preparation of Test Samples

**5.1.1** Draw with an appropriate sampling instrument a small portion of the material from different parts of each package selected for sampling. In the case of large packages the sampling instrument conforming to IS: 2815-1964† is recommended for use.

The total quantity of material drawn from each package shall be sufficient to conduct tests for all the characteristics specified.

**5.1.2** Thoroughly mix all portions of the material drawn from the same package and divide the same into three equal parts. These parts shall be transferred immediately to thoroughly dried bottles which are then sealed air-tight with stoppers and labelled with all the particulars of sampling given in **3.1.5**. The material in each such sealed bottle shall constitute an individual test sample. These individual samples shall be separated into three identical sets in such a way that each set has a test sample representing each package selected. One of these three sets shall be sent to the purchaser, another to the supplier and the third shall be used as referee sample.

**5.2 Referee Sample**—The referee sample consisting of a set of individual test samples (*see* **5.1.2**) to be used in case of a dispute shall bear the seals of the purchaser and the vendor and shall be kept in a place agreed to between the two.

## 6. NUMBER OF TESTS

**6.1** Tests for the determination of particle size, specific gravity, aluminium oxide content, magnetic material content and loss on ignition shall be conducted on each of the individual samples separately.

\*Methods for random sampling.

†Specification for slotted tube sampler.

## 7. CRITERIA FOR CONFORMITY

**7.1** For each of the characteristics which have been tested on the individual test samples (see 6.1), the mean  $\bar{X}$  and the range  $R$  of test results shall be computed separately, wherever possible.

**NOTE** — The lot shall be declared as conforming to the requirements of the specification if the conditions stipulated in 7.1.1 to 7.1.3 are satisfied.

### 7.1.1 For Particle Size

- a) All the material in each of the individual samples shall pass the coarse sieves (see Table 2 of IS:3178-1965\*).
- b) The value of the expression  $(\bar{X} + 0.4R)$  as calculated from the percentages of material retained on the medium sieve (see Table 2 of IS:3178-1965\*) shall be less than or equal to 25.
- c) The value of the expression  $(\bar{X} - 0.4R)$  as calculated from the percentages of the material retained on the fine sieve (see Table 2 of IS:3178-1965\*) shall be greater than or equal to 50.

**7.1.2 For Specific Gravity and Aluminium Oxide Content** — The value of the expression  $(\bar{X} - 0.4R)$  calculated from the relevant test results shall be greater than or equal to the corresponding minimum limits specified in Table 1 of IS:3178-1965\*.

**7.1.3 For Magnetic Material and Loss on Ignition** — The value of the expression  $(\bar{X} + 0.4R)$  as calculated from the relevant test results shall be less than or equal to the maximum limits specified for these characteristics in 5.3 and 5.4 of IS:3178-1965\*.

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\*Specification for abrasive emery grain.

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